PATENT
P55955

CLEAN VERSION OF AMENDMENTS

IN THE CLAIMS

Please cancel claims 6 and 8 without prejudice or disclaimer as to their subject matter by this amendment, amend claims 1-5, 7, 9, 10, 12, 14 and 15 by this amendment and newly add claims 17-23 by this amendment as follows:

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1. (Amended) An optical channel monitoring apparatus, comprising:

an input unit comprising a lensed fiber receiving a wavelength division multiplexed (WDM) optical signal via an optical transmission medium and producing a collimated beam of optical signals, said input unit further comprising a concave lens receiving said collimated beam and outputting a plurality of optical signals that have a continuous range of incidence angles according to the wavelengths each of said plurality of optical signals; and

a filter for receiving said plurality of optical signals from the input unit and separating the WDM optical signal into a plurality of optical signals having different wavelengths using the difference between resonance lengths according to the incident angles.

2. (Amended) The apparatus of claim 1, further comprising an array of detectors receiving optical signals output by said filter and converting said optical signals into electrical signals, each detector being positioned to pick up a specific wavelength of incident radiation emanating from the filter, said apparatus further comprising a microprocessor calculating signal to noise ratio and spectral components of said optical signals output from said filter.

3. (Amended) The apparatus claim 2, an etalon is used as the filter.

4. (Amended) An optical channel monitoring apparatus, comprising:

an input part receiving a multiplexed, collimated optical signal and dispersing said collimated optical signal via a concave lens into a beam having different incident angles;

an optical filter receiving the wavelength division multiplexed (WDM) optical signal having different incident angles from the input part and separating the spanned WDM optical signal into a plurality of optical signals having different wavelengths using the difference between resonance lengths according to the different incidence angles; and

a plurality of detectors, each detector being spatially positioned to receive incident radiation of a specific wavelength, said plurality of detectors detecting the intensity of each of said plurality of optical signals having different wavelengths and converting said optical signals to electrical signals.

5. (Amended) An optical channel monitoring method, comprising the steps of:

receiving a wavelength division multiplexed (WDM) optical signal from an optical transmission medium and outputting, via a concave lens, a plurality of optical signals spanning a continuous range of incidence angles according to the wavelengths of the optical signals;

receiving said plurality of optical signals spanning said range of incident angles and separating the WDM optical signal according to wavelengths using the difference between

resonance lengths according to the different incidence angles; and

detecting the intensity of each of said plurality of optical signals having different wavelengths and converting said intensity into a corresponding plurality of electrical signals.

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7. (Amended) The apparatus of claim 3, further comprising a beam size controller between said etalon and said detector to amplify said plurality of optical signals having different wavelengths in order to be detected by said array of detectors.

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9. (Amended) The apparatus of claim 4, said concave lens dispersing an input collimated WDM beam into a beam spanning a range of angles, said range of angles being about 10 degrees.

10. (Amended) The apparatus of claim 9, further comprising an optical amplifier amplifying each of said plurality of optical signals having different wavelengths output by said filter allowing said plurality of optical signals having different wavelengths to be detected by corresponding ones of said plurality of detectors.

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12. (Amended) The apparatus of claim 10, further comprising a microprocessor that determines the wavelength and the optical signal to noise ratio for each of said plurality of optical signals having different wavelengths from said plurality of electrical signals produced by said plurality of detectors.

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14. (Amended) The method of claim 13, further comprising the step of determining spectral components and the optical signal to noise ratio for each wavelength in said plurality of optical signals having different wavelengths by processing said plurality of electrical signals by said microprocessor.

15. (Amended) The method of claim 14, further comprising the step of amplifying said plurality of optical signals having different wavelengths immediately after separating said optical signals according to wavelengths and immediately prior to said detecting step.

--17. A method for monitoring and diagnosing spectral components and signal to noise rations of a WDM optical signals passing through an optical fiber, said method comprising the steps of:

outputting said optical signals out of an end of said optical fiber, said end of said optical fiber being lensed producing collimated optical signals upon being output from said optical fiber;

inputting said collimated optical signals into a cylindrical concave lens producing a continuous span of output angles of propagation of said optical signals;

inputting said span of optical signals into a Fabry Perot etalon resonator to separate said optical signals by wavelengths based on incident angles input into said etalon;

inputting said optical signals separated by wavelengths onto an array of detectors producing electrical signals corresponding to wavelengths of said optical signals output from said etalon; and

inputting said electrical signals into a microprocessor to calculate spectral components of said optical signal and signal to noise ratio of said optical signal.

18. The method of claim 17, said continuous span of angles being 10 degrees corresponding to a 25 nm range of wavelengths being diagnosed and monitored.

19. The method of claim 17, said method being able to analyze spectral components of said optical signal with a resolution of 0.1 nm.

20. The method of claim 18, said etalon having a thickness of 28 nm and the FSR of the etalon being 30 nm.

21. The method of claim 17, further comprising the step of amplifying said optical signals separated by wavelengths emerging from said etalon prior to inputting said optical signals onto said array of detectors.

22. The apparatus of claim 11, said etalon being 28 nm thick, said etalon having a FSR of 30 nm, said apparatus having a resolution of 0.1 nm.

23. The apparatus of claim 3, said etalon being 28 nm thick, said etalon having a FSR of 30 nm, said apparatus having a resolution of 0.1 nm.--